

USB FLASH DRIVES

INTRODUCTION

Flash drives have taken over from floppy disks and optical media as the best way to carry around everyday files. They're great for carrying photos to show to a friend, or as an inexpensive backup device for important documents.

Even very cheap flash drives can hold 2GB of data. This is enough for around five hundred MP3 tracks, one thousand 8-megapixel photos, or five hours of high-quality DivX video.

Drives come in a wide range of shapes and sizes, from the very compact to the almost indestructible. Many also have extra features such as data encryption, or the ability to run applications directly from the drive without installing them.

We've gathered 16 flash drives for this Labs, with prices as low as £15 and capacities as high as 32GB. Whatever files you want to carry, there's a drive here to fit your needs.

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FLASH FORWARD

Whether you need a cheap backup for essential files or a convenient way to transfer media from one PC to another, a USB flash drive is ideal. We test 16 from just £15

Choosing a... USB Flash Drive

There's more to choosing a USB flash drive than just buying the largest capacity you can afford.

You should also consider aspects such as performance, design and features. This buying guide will help you choose the right flash drive.

Flash drives' transfer speeds vary considerably. The slowest will take an age to transfer large numbers of files. The quickest drives, on the other hand, are around as fast as portable USB hard disks when copying large or medium-sized files such as photos, but are far slower when copying large numbers of small files.

We ran all our tests with the drives plugged into high-speed USB2 ports, which are standard on all modern PCs and notebooks. All the drives in the group will work with older USB1.1 ports, but speeds will be limited to a maximum of 1.5MB/s.

ALL KINDS OF EVERYTHING

The flash drives in this month's Labs come in a variety of shapes and sizes. Kingston's Mini Fun will hang inconspicuously from your key ring, while Freecom's USBCard can slip into your wallet just like a credit card. Corsair's Flash Survivor is the toughest flash drive in this round-up, with an aluminium external casing to protect your files, while others have rubber

casings to protect the memory chips against shock damage.

It can be easy to lose a flash drive's cap, which leaves the USB connector vulnerable to dust and dirt. Fortunately, many flash drive manufacturers have come up with solutions to this problem, which we've pointed out in the individual reviews.

TOP SECRET

If you are going to carry sensitive files around, you should use some form of encryption on your flash drive, just in case it's lost or stolen. Many of the drives here come with software that will encrypt your files if they are put into specific folders on the drive. You'll then need to use a password to access them.

It's possible to carry your applications around on a flash drive and run them directly from the drive without installing them first. When you plug in the drive, a menu pops up with various programs for tasks such as email, web browsing and word processing. Several drives come with applications such as U3 and PowerToGo for this purpose. Even if your drive doesn't come with this feature as standard, you can download the free PortableApps suite from www.portableapps.com, which does the same job.

USB FLASH DRIVES

BUDGET BUY

MANUFACTURER	CORSAIR	CORSAIR	FREECOM	LEXAR
Model	Flash Padlock 2GB	Flash Voyager 4GB	USBCard 4GB	JumpDrive Lightning 2GB
Rating	★★★	★★★★★	★★★★	★★★★
STORAGE				
Capacity	2GB	4GB	4GB	2GB
Formatted capacity (NTFS)	1.87GB	3.74GB	3.77GB	1.86GB
Price per gigabyte	£8.02	£4.81	£4.77	£10.22
Weight	26g	12g	10g	23g
Dimensions (HxWxD)	14x23x86mm	18x23x74mm	2x54x85mm	11x23x76mm
Vista ReadyBoost compatible	Yes	Yes	Yes	Yes
U3 feature	No	No	No	No
Encryption	No	Yes	Yes	Yes
BUYING INFORMATION				
Bundled software	None	TrueCrypt 4.3	Carry It Easy	PowerToGo, Secure II
Included accessories	USB extension cable, lanyard	USB extension cable, lanyard	None	None
Price including VAT	£15	£18	£18	£19
Warranty	Three years RTB	10 years RTB	One year RTB	Lifetime
Supplier	www.scan.co.uk	www.overclockers.co.uk	www.techstore.co.uk	www.techstore.co.uk
Details	www.corsair.com	www.corsair.com	www.freecom.com	www.lexar.com
Part code	CMFUSBPADLOCK-2GB	CMFUSB2.0-4GB	28156	JDP2GB-715
	The Padlock is the cheapest flash drive here, but it costs £8 per gigabyte. It feels sturdy enough, but there's nowhere to put the cap when detached. It has a keypad security system, allowing you to lock access to the drive via a PIN. The drive was quick to read files, but its average write speeds place it halfway down the group overall. The security system will appeal to some, but Corsair's 4GB Voyager is better value.	The Voyager is the joint-cheapest 4GB flash drive in the group and it costs a reasonable £4.81 per gigabyte. The outer casing is rubber and should absorb any bumps or shocks. Unfortunately, there's nowhere to stow the rubber cap when detached. Corsair's Voyager was the second-fastest drive in our photo files test, and produced respectable speeds in all others. It's a great choice if you need something durable and inexpensive.	The USBCard costs the same as Corsair's Flash Voyager, and has the same 4GB capacity. Its credit card design means you can slip it into your wallet and carry your data with the rest of your valuables. A slender connector folds out from the card, so there's no cap to lose. Freecom's USBCard managed respectable read speeds, but was very slow in our write tests. Despite this, its low price and convenient shape make it a good choice for occasional use.	While £19 for 2GB of storage may seem expensive, the Lightning is good-looking and feels tough. Its cap fits neatly on its end when the drive is in use. The Lightning is a fast drive, achieving some of the quickest file transfer speeds in our read and write tests. It comes with Lexar's PowerToGo software, which lets you run applications straight from the drive. Corsair's Flash Voyager is better value, but if you're after a fast drive then Lexar's Lightning is a great buy.



BEST BUY

MANUFACTURER	SONY	PNY	LEXAR	SANDISK
Model	Micro Vault Midi 8GB	Attache Optima 8GB	JumpDrive Secure II Plus 8GB	Cruzer Contour 8GB
Rating	★★★	★★★	★★★	★★★★★
STORAGE				
Capacity	8GB	8GB	8GB	8GB
Formatted capacity (NTFS)	7.46GB	7.67GB	7.45GB	7.63GB
Price per gigabyte	£3.75	£4.43	£4.69	£4.84
Weight	6g	14g	11g	31g
Dimensions (HxWxD)	7x18x67mm	10x19x69mm	8x21x69mm	9x23x73mm
Vista ReadyBoost compatible	Yes	Yes	Yes	Yes
U3 feature	No	No	No	Yes
Encryption	No	Yes	Yes	Yes
BUYING INFORMATION				
Bundled software	Micro Vault Virtual Expander	Carry it Easy +Plus	PowerToGo, Secure II	U3, CruzerSync, HP PhotoSmart, Avast! Antivirus, SignupShield, BigFish Sudoku, BigFish Mahjong Towers Eternity
Included accessories	None	None	None	Carrying pouch
Price including VAT	£28	£34	£35	£37
Warranty	Five years RTB	Two years RTB	Two years RTB	Lifetime
Supplier	www.lambda-tek.com/componentsshop	www.cclonline.com	www.ebuyer.com	www.mymemory.co.uk
Details	www.sony.co.uk	www.pny-europe.com	www.lexar.com	www.sandisk.com
Part code	USM8GR	P-FD8GBA20PT-BX	JDSEP8GB-715	SDCZ8-8192-E75
	Compared to most drives here, Sony's Micro Vault Midi is cheap-looking and feels flimsy. A switch on the side pushes the connector out of the drive's body, though there's no flap for protection from gunk or fluff when it's retracted. The Micro Vault Midi's file transfer speeds were average for the group, but it was very slow in our photo read test. You can use the included file compression utility to squeeze more into the memory, but this slows things down further. Sandisk's Cruzer Contour is a better 8GB flash drive.	The Attache Optima's twisting design is easy to use once you get used to it and protects the USB connector from damage and dirt. The drive is good value, with its 8GB of storage costing a reasonable £4.43 per gigabyte. It gained above-average scores in our tests, but was slow writing small files. The drive comes with the Carry it Easy +Plus suite, which lets you synchronise documents and Outlook emails with your PC. The software is useful, but most people will be better off with Sandisk's faster Cruzer Contour.	This small and slender flash drive has an LCD storage capacity meter on the front, so you can see how much free space remains. The meter measures free space in percentages rather than megabytes, so it's hard to work out how much space you have. The drive comes with a 128-bit encryption application. The JumpDrive was the slowest drive in the group when reading small files, and was slower than most of the 8GB drives overall. Sandisk's Cruzer Contour is just £3 more and is far faster.	Sandisk's Cruzer Contour is the most stylish flash drive here. It takes a while to get used to its sliding design, but once mastered it's easy to open. The connector is hidden behind a door, which protects it from dust. The Cruzer Contour was fast in all our tests, and the fastest drive in the small file writing test. It was also the quickest 8GB drive overall, just ahead of PNY's Attache Optima. It's a U3 drive so comes preloaded with many useful applications. The Cruzer Contour is stylish and quick, and wins a Best Buy award.



FREECOM	BUFFALO	KINGSTON	SANDISK
DataBar 8GB	FireStix 2GB	DataTraveler Mini Fun 4GB	Cruzer Titanium 4GB
★★★	★★★★	★★★	★★★
8GB	2GB	4GB	4GB
7.54GB	1.91GB	3.81GB	3.80GB
£2.65	£10.99	£6.04	£7.11
9g	11g	4g	17g
10x18x64mm	10x17x67mm	8x19x38mm	7x19x58mm
Yes	Yes	Yes	Yes
No	No	No	Yes
Yes	Yes	No	Yes
Carry It Easy	Buffalo Secure Lock Ware, TurboUSB	Big Fish Games (Atlantis and Sudoku)	U3, CruzerSync, HP PhotoSmart, Avast! Antivirus, SignupShield, BigFish Sudoku, BigFish Mahjong Towers Eternity
None	None	Mini lanyard	None
£20	£21	£23	£27
One year RTB	One year RTB	Five years RTB	Five years RTB
www.amazon.co.uk	www.ballicom.co.uk	www.morecomputers.co.uk	www.kikatek.com
www.freecom.com	www.buffalo-technology.com	www.kingston.com	www.sandisk.com
29154	RUF2-R2G-S	DTMFR/4GB	SDCZ7-4096-E10RB
FreeCom's DataBar is the cheapest 8GB flash drive here and the cheapest drive per gigabyte at only £2.65. Like all the FreeCom drives, it comes with Carry It Easy software, which provides 128-bit encryption and a portable version of Outlook Express, and it can carry your Internet Explorer or Firefox favourites. The DataBar was one of the slowest drives in the group in all our tests, so it'll take you a while to fill its 8GB storage. We recommend one of the smaller and faster drives.	The FireStix's small capacity and high price make it the second-most expensive flash drive per gigabyte here. It's hardly stylish, either, though there is a useful pen-style clip and a lid that fits on the rear when not needed. It also comes with 256-bit encryption software. Buffalo's FireStix is a very fast drive, with some of the quickest scores here when reading both large and small files, and respectable speeds in all our other tests. Lexar's JumpDrive Lightning is just as quick and feels tougher, though.	Most of the drives in the group are fairly small, but Kingston's DataTraveler Mini Fun makes the rest look huge. It weighs just 4g and is only 38mm long, so you could attach it to your key ring with the supplied mini lanyard and carry it around without noticing its presence. The lid plugs into the rear of the drive with Lego-like studs. This is one of the slowest drives in the group, and was especially slow in our photo writing test. It's a good-looking and tiny drive, but it's too slow for anything more than occasional use.	The Cruzer Titanium's casing is made of a fancy-looking metal alloy, making it feel like one of the toughest drives here. A switch slides the USB connector out from the main body, but when it's retracted there's no flap to stop dirt or fluff getting in. This is a U3 device, so it comes preinstalled with some useful applications that run straight from the drive. You can add the same feature to any of the drives here with the free PortableApps suite, however. This is a smart-looking, fairly quick drive, but Corsair's Voyager is far better value.



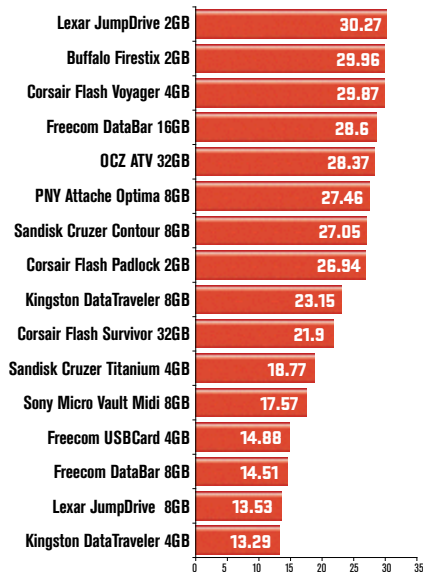
FREECOM	OCZ	CORSAIR	KINGSTON
DataBar 16GB	ATV 32GB	Flash Survivor 32GB	DataTraveler Secure 8GB
★★★★	★★★★★	★★★★	★★
16GB	32GB	32GB	8GB
14.90GB	29.80GB	30.60GB	7.59GB
£3.96	£3.36	£4.22	£19.50
9g	15g	44g	26g
10x18x64mm	10x21x82mm	83x20x20mm	12x22x77mm
Yes	Yes	Yes	Yes
No	No	No	No
Yes	No	Yes	Yes
Carry It Easy	None	Truecrypt 4.3	MyDatazone, MyTraveler
None	None	USB extension cable, lanyard	None
£59	£100	£129	£148
One year RTB	Lifetime	10 years RTB	Five years RTB
www.novatech.co.uk	www.aria.co.uk	www.scan.co.uk	www.morecomputers.co.uk
www.freecom.com	www.ocztechnology.com	www.corsair.com	www.kingston.com
30475	OCZUSBATV32G	CMFUSBSRVR-32GB	DTS/8GB
This is the only 16GB flash drive here, and is identical to the 8GB DataBar in design and features. At £3.96 per gigabyte it's reasonable value, but you could buy two of FreeCom's 8GB drives instead and still have £19 left over. The drive had impressive scores in the small and large read tests, but was slow to write files. FreeCom's DataBar is not the fastest drive here, but it's an acceptable budget alternative to the 32GB drives from OCZ and Corsair.	The ATV's rubber outer casing should absorb most bumps and knocks without a problem. The cap is made of the same material and attaches to a dangling tab when not needed. There's no software provided, but you can download encryption and application software for free. OCZ's ATV was consistently quick in our tests, and far faster than Corsair's Survivor when writing small files. It's not as tough as the Survivor, but it's still sturdy and is better value.	The Survivor is certainly the toughest drive in the group, thanks to its screw-on aluminium outer casing and watertight seals. This makes it rather chunky, but it feels indestructible. The drive comes with the free 256-bit TrueCrypt encryption software. It was quick in our large file writing test, but was the slowest drive here when writing small files. The drive has a huge 32GB of storage, but it's expensive at £129 including VAT. Unless you really need a super-tough flash drive, we'd recommend OCZ's fairly tough ATV instead.	Kingston's DataTraveler Secure looks and feels like a tough flash drive. It's even waterproof and the cap attaches to the rear of the drive when not needed. Unlike the other flash drives here, the DataTraveler Secure has hardware 256-bit encryption. After a set number of failed password attempts, the drive wipes your sensitive data. The drive gained fairly average speeds in our file transfer tests. At £148 including VAT, it's horribly expensive for an 8GB drive, so only those who are carrying extremely sensitive data should buy it.



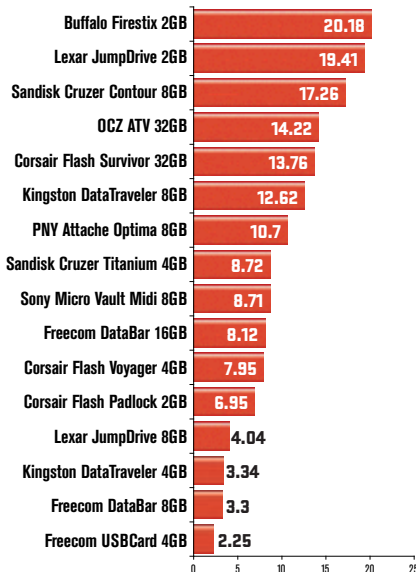
BENCHMARKS

Performance USB flash drives

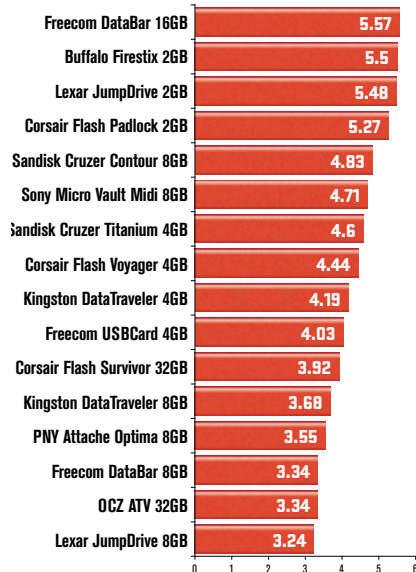
Read large files



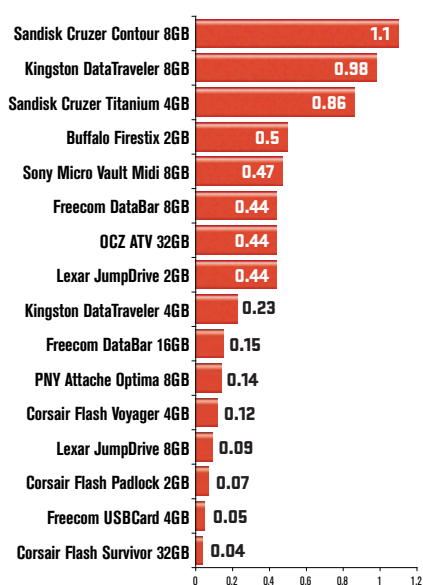
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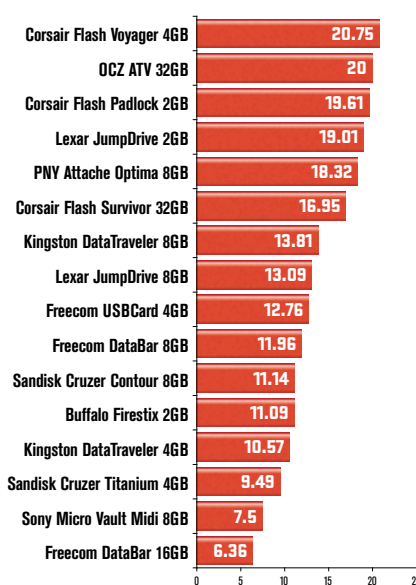
Read small files



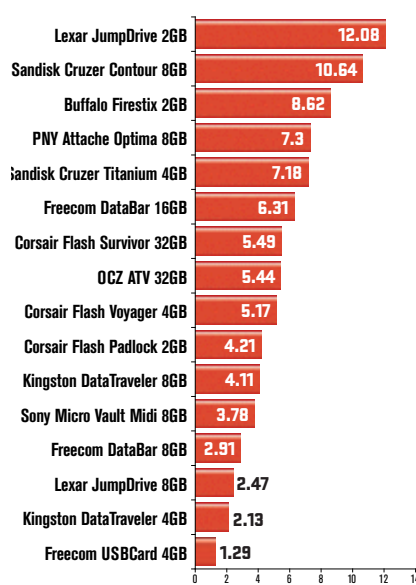
Write small files



Read photo files



Write photo files



Labs verdict Flash drives

There's certainly more to buying a flash drive than just memory capacity and price. After carefully considering each drive's performance and design, we've picked out four that are particularly deserving of your attention.

If you need lots of storage space, we recommend OCZ's ATV. It's tough, quick and good value at £100 for 32GB. At the other end of the capacity scale is Lexar's 2GB JumpDrive Lightning. This flash drive feels like it could take a few knocks, and lives up to its name with super-fast transfer speeds.

Our Budget Buy winner is Corsair's Flash Voyager. It's small, tough and quick, and it is a bargain at only £18 for 4GB of storage. Our overall favourite, however, is Sandisk's stylish 8GB Cruzer Contour. Its great design keeps the connector safe from dust and fluff, and it has consistently fast transfer speeds. It's a Best Buy.



How we test Flash drives

To test each flash drive's real world performance, we ran six file transfer tests on each drive. For each test, we used an automated script to copy files from the test PC's RAM to the drive. As RAM is far faster than flash memory, this ensured that the flash drive was always the limiting factor in our speed tests.

In our large files test, a 100MB file was copied to and from each drive five times to simulate copying large files such as video. In our small files test, 100MB of small files was copied to and from each drive five times, to simulate how long it takes to transfer smaller files such as text documents or spreadsheets. Finally, we timed how long it took to copy 500MB of photos to and from the drive to simulate backing up a typical digital camera's memory card. **CS**